WHAT IS CLAIMED IS:

1. A method for governing a compression ignition engine, the method comprising:

a) processing data values for actual engine speed and desired engine speed to yield a data value for engine speed error;

b) processing the data value for engine speed error according to a governor algorithm for yielding a data value for a mass fuel rate for governed fueling of the engine;

c) processing the data value for mass fuel rate for governed fueling of the engine and the data value for actual engine speed to yield a data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder; and

d) injecting that quantity of fuel into the cylinder during that stroke.

2. A method as set forth in claim 1 in which step c) comprises processing the data value for mass fuel rate for fueling the engine and the data value for actual engine speed such that i) an increase in the data value for actual engine speed relative to the data value for desired engine speed will cause the data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder to decrease, and ii) and a decrease in the data value for actual engine speed relative to the data value for desired engine speed will cause the data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder to increase.

3. A method as set forth in claim 2 in which step c) comprises dividing the data value for mass fuel rate for fueling the engine by the data value for actual engine speed and multiplying the data value for the quotient by a multiplier, and step d) comprises injecting fuel into the cylinder during the ensuing stroke in a quantity corresponding to the product of the multiplication.

4. A method as set forth in claim 3 in which the step of multiplying the data value for the quotient by a multiplier comprises multiplying the data value for the quotient by a constant.

5. A compression ignition internal combustion engine comprising:

a) multiple cylinders into which a fueling system injects fuel during engine cycles;

b) an engine control system that comprises a governor for governing the engine and a data processing system for processing various data useful in governing the engine including data values for actual engine speed and desired engine speed;

c) wherein the data processing system repeatedly i) processes the data values for actual engine speed and desired engine speed to yield data values for engine speed error, ii) processes the data values for engine speed error according to an algorithm for yielding data values for mass fuel rate for fueling the engine, iii) processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed to yield data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders; and iv) causes the

fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

6. An engine as set forth in claim 5 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed such that i) increases in the data values for actual engine speed relative to the data values for desired engine speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to decrease, and ii) and decreases in the data values for actual engine speed relative to the data values for desired engine speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to increase.

7. An engine as set forth in claim 6 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed by dividing the data values for mass fuel rate for fueling the engine by the data values for actual engine speed and multiplying the data values for the quotients by a multiplier, and causes the fueling system to inject fuel into the respective cylinders during respective ensuing strokes in quantities corresponding to the products of the multiplications.

8. An engine as set forth in claim 7 in which the multiplier is a constant.

9. A control system for governing a compression ignition internal combustion engine having multiple cylinders into which a fueling system injects fuel during engine cycles, the control system comprising:

a) a data processing system for processing various data, including data values for actual engine speed and desired engine speed, according to an algorithm for governing the engine;

c) wherein the data processing system repeatedly i) processes the data values for actual engine speed and desired engine speed to yield data values for engine speed error, ii) processes the data values for engine speed error according to an algorithm for yielding data values for mass fuel rate for fueling the engine, iii) processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed to yield data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders; and iv) commands the fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

10. A control system as set forth in claim 9 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed such that i) increases in the data values for actual engine speed relative to the data values for desired engine speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to decrease, and ii) and decreases in the data values for actual engine speed relative to the data values for desired engine speed

will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to increase.

11. A control system as set forth in claim 10 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed by dividing the data values for mass fuel rate for fueling the engine by the data values for actual engine speed and multiplying the data values for the quotients by a multiplier, and commands the fueling system to inject fuel into the respective cylinders during respective ensuing strokes in quantities corresponding to the products of the multiplications.

12. A control system as set forth in claim 11 in which multiplier is a constant.

13. A method for governing idle speed of a compression ignition engine, the method comprising:

a) processing data values for actual engine speed and desired idle speed to yield a data value for speed error;

b) processing the data value for speed error according to an algorithm for yielding a data value for a mass fuel rate for fueling the engine;

c) processing the data value for mass fuel rate for fueling the engine and the data value for actual engine speed to yield a data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder; and

d) injecting that quantity of fuel into the cylinder during that stroke.

14. A method as set forth in claim 13 in which step c) comprises processing the data value for mass fuel rate for fueling the engine and the data value for actual engine speed such that i) an increase in the data value for actual engine speed relative to the data value for desired idle speed will cause the data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder to decrease, and ii) and a decrease in the data value for actual engine speed relative to the data value for desired idle speed will cause the data value for a quantity of fuel to be injected into an engine cylinder during an ensuing stroke of a piston within the cylinder to increase.

15. A method as set forth in claim 14 in which step c) comprises dividing the data value for mass fuel rate for fueling the engine by the data value for actual engine speed and multiplying the data value for the quotient by a multiplier, and step d) comprises injecting fuel into the cylinder during the ensuing stroke in a quantity corresponding to the product of the multiplication.

16. A method as set forth in claim 15 in which the step of multiplying the data value for the quotient by a multiplier comprises multiplying the data value for the quotient by a constant.

17. A compression ignition internal combustion engine comprising:

a) multiple cylinders into which a fueling system injects fuel during engine cycles;

b) an engine control system that comprises a governor for governing the engine and a data processing system for processing various data useful in governing the engine including data values for actual engine speed and desired idle speed;

c) wherein the data processing system repeatedly i) processes the data values for actual engine speed and desired idle speed to yield data values for idle speed error, ii) processes the data values for idle speed error according to an algorithm for yielding data values for mass fuel rate for fueling the engine, iii) processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed to yield data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders; and iv) causes the fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

18. An engine as set forth in claim 17 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed such that i) increases in the data values for actual engine speed relative to the data values for desired idle speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to decrease, and ii) and decreases in the data values for actual engine speed relative to the data values for desired idle speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to increase.

19. An engine as set forth in claim 18 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed by dividing the data values for mass fuel rate for fueling the engine by the data values for actual engine speed and multiplying the data values for the quotients by a multiplier, and causes the fueling system to inject fuel into the respective cylinders during respective ensuing strokes in quantities corresponding to the products of the multiplications.

20. An engine as set forth in claim 19 in which the multiplier is a constant.

21. A control system for governing a compression ignition internal combustion engine having multiple cylinders into which a fueling system injects fuel during engine cycles, the control system comprising:

a) a data processing system for processing various data, including data values for actual engine speed and desired idle speed, according to an algorithm for governing the engine;

c) wherein the data processing system repeatedly i) processes the data values for actual engine speed and desired idle speed to yield data values for idle speed error, ii) processes the data values for idle speed error according to an algorithm for yielding data values for mass fuel rate for fueling the engine, iii) processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed to yield data values for quantities of fuel to be injected into the engine cylinders during ensuing

strokes of pistons within the respective cylinders; and iv) commands the fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

22. A control system as set forth in claim 21 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed such that i) increases in the data values for actual engine speed relative to the data values for desired idle speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to decrease, and ii) and decreases in the data values for actual engine speed relative to the data values for desired idle speed will cause the data values for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders to increase.

23. A control system as set forth in claim 22 in which the data processing system processes the data values for mass fuel rate for fueling the engine and the data values for actual engine speed by dividing the data values for mass fuel rate for fueling the engine by the data values for actual engine speed and multiplying the data values for the quotients by a multiplier, and commands the fueling system to inject fuel into the respective cylinders during respective ensuing strokes in quantities corresponding to the products of the multiplications.

24. A control system as set forth in claim 23 in which multiplier is a constant.

25. A method for governing a compression ignition internal combustion engine having multiple cylinders into which a fueling system injects fuel during engine cycles, the method comprising:

operating a governor in a manner that that sets a governed fuel flow rate in units measured in mass of fuel per unit of time.

26. A method as set forth in claim 25 including the further steps of processing various data useful in controlling the engine including the data value for the governed fuel flow rate set by the governor and a data value for actual engine speed to yield data values, measured in mass of fuel per stroke, for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders, and causing the fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

27. A compression ignition internal combustion engine comprising:

a) multiple cylinders into which a fueling system injects fuel during engine cycles; and

b) an engine control system that comprises a governor that sets a governed fuel flow rate in units measured in mass of fuel per unit of time.

28. An engine as set forth in claim 27 in which the control system comprises a data processing system for processing various data useful in

controlling the engine including the data value for the governed fuel flow rate set by the governor and a data value for actual engine speed to yield data values, measured in mass of fuel per stroke, for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders.

29. An engine as set forth in Claim 28 in which the control system further causes the fueling system to inject those quantities of fuel into the respective cylinders during respective ensuing strokes.

30. A control system for a compression ignition internal combustion engine that has multiple cylinders into which a fueling system injects fuel during engine cycles, the control system comprising:

a governor that sets a governed fuel flow rate in units measured in mass of fuel per unit of time.

31. A control system as set forth in claim 30 in which the control system comprises a data processing system for processing various data useful in controlling the engine including the data value for the governed fuel flow rate set by the governor and a data value for actual engine speed to yield data values, measured in mass of fuel per stroke, for quantities of fuel to be injected into the engine cylinders during ensuing strokes of pistons within the respective cylinders.

32. A control system as set forth in Claim 31 in which the control system further issues a command for causing the fueling system to inject

those quantities of fuel into the respective cylinders during respective ensuing strokes.

33. A compression ignition internal combustion engine comprising:

a) multiple cylinders into which a fueling system injects fuel during engine cycles; and

b) an engine control system

that comprises

i) a low-idle governor for governing engine fueling to run the engine at low idle speed by issuing a fueling command measured in fueling rate units of measurement,

ii) a conversion function for converting the fueling command from fueling rate units of measurement to quantity-per-stroke units of measurement, and

iii) an accelerator for accelerating the engine from low idle speed by issuing a fueling command measured in quantity-per-stroke units of measurement,

that when the engine is running at low idle speed, causes fuel to be injected into the cylinders in quantities-per-stroke set by the conversion function, and

that when the engine is accelerated from low idle speed utilizes the fueling command from the accelerator in setting the quantities-per-stroke injected into the cylinders.

34. An engine as set forth in claim 33 in which the control system comprises a summing function that additively sums the quantity-per-stroke

measurement set by the conversion function and the quantity-per-stroke measurement set by the accelerator, and then uses the sum to set the quantity-per-stroke injected into a cylinder.

35. An engine as set forth in claim 34 in which the control system comprises a fuel limit setting function for setting a maximum fuel limit and a minimum selection function that selects from a quantity-per-stroke maximum fuel limit set by the fuel limit setting function and the sum, one having the same or lower value, and then uses the selection to set the quantity-per-stroke injected into a cylinder.

36. A control system for a compression ignition internal combustion engine having multiple cylinders into which a fueling system injects fuel during engine cycles, the control system comprising:

i) a low-idle governor for governing engine fueling to run the engine at low idle speed by issuing a fueling command measured in fueling rate units of measurement,

ii) a conversion function for converting the fueling command from fueling rate units of measurement to quantity-per-stroke units of measurement, and

iii) an accelerator for accelerating the engine from low idle speed by issuing a fueling command measured in quantity-per-stroke units of measurement, for causing fuel to be injected into the cylinders in quantities-per-stroke set by the conversion function when the engine running at low idle speed, and for utilizing the fueling command from

the accelerator in setting the quantities-per-stroke injected into the cylinders when the engine is accelerated from low idle speed.

37. A control system as set forth in claim 36 further comprising a summing function that additively sums the quantity-per-stroke measurement set by the conversion function and the quantity-per-stroke measurement set by the accelerator, and then uses the sum to set the quantity-per-stroke injected into a cylinder.

38. A control system as set forth in claim 37 further comprising a fuel limit setting function for setting a maximum fuel limit and a minimum selection function that selects from a quantity-per-stroke maximum fuel limit set by the fuel limit setting function and the sum, one having the same or lower value, and then uses the selection to set the quantity-per-stroke injected into a cylinder.

39. A method for low-idle governing and subsequent acceleration of a compression ignition engine having multiple cylinders into which a fueling system injects fuel during engine cycles, the method comprising:

a) governing engine fueling to run the engine at low idle speed

i) by processing data to yield a data value for a fueling command measured in fueling rate units of measurement for governing engine fueling to run the engine at low idle speed,

ii) by processing data to convert the data value for the low-idle fueling command from fueling rate units of measurement to quantity-per-stroke units of measurement, and

iii) by causing fuel to be injected into the cylinders in quantities-per-stroke resulting from the conversion,

and

b) accelerating the engine from low idle speed

i) by processing data from an accelerator to yield a fueling command measured in quantity-per-stroke units of measurement, and

ii) by utilizing the fueling command from the accelerator in setting the quantities-per-stroke injected into the cylinders.

40. A method as set forth in Claim 39 further comprising additively summing the quantity-per-stroke measurement set by the conversion and the quantity-per-stroke measurement set by the accelerator, and then using the sum to set the quantity-per-stroke injected into a cylinder

41. A method as set forth in claim 40 further comprising setting a quantity-per-stroke maximum fuel limit and selecting from the quantity-per-stroke maximum fuel limit set and the sum, one having the same or lower value, and then using the selection to set the quantity-per-stroke injected into a cylinder.